

What is claimed is:

1. A heat treated and slow quenched aluminum alloy sheet comprising from about 0.5 to about 0.7 wt.% Si, from about 0.5 to about 0.7 wt.% Mg, from about 0.1 to about 0.3 wt.% Mn, and the balance Al and incidental impurities.
2. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the Si comprises from about 0.58 to about 0.68 wt.%.
3. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the Si comprises from about 0.60 to about 0.66 wt.%.
4. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the Mg comprises from about 0.56 to about 0.66 wt.%.
5. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the Mg comprises from about 0.58 to about 0.64 wt.%.
6. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the Mn comprises from about 0.12 to about 0.18 wt.%.

7. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the aluminum alloy comprises a maximum of 0.35 wt.% Fe.

8. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the aluminum alloy comprises from about 0.15 to about 0.30 wt.% Fe.

9. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the aluminum alloy comprises from about 0.15 to about 0.25 wt.% Fe.

10. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the aluminum alloy comprises a maximum of 0.20 wt.% Cu.

11. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the aluminum alloy comprises a maximum of 0.10 wt.% Cu.

12. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the Si comprises from about 0.58 to about 0.68 wt.%, the Mg comprises from about 0.56 to about 0.66 wt.%, and the Mn comprises from about 0.12 to about 0.18 wt.%.

13. The heat treated and slow quenched aluminum alloy sheet of claim 12 wherein the aluminum alloy comprises from about 0.15 to about 0.30 wt.% Fe, and a maximum of 0.10 wt.% Cu.

14. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the Si comprises from about 0.60 to about 0.66 wt.%, the Mg comprises from about 0.58 to about 0.64 wt.%, and the Mn comprises from about 0.12 to about 0.18 wt.%.

15. The heat treated and slow quenched aluminum alloy sheet of claim 14 wherein the aluminum alloy comprises from about 0.15 to about 0.25 wt.% Fe, and a maximum of 0.10 wt.% Cu.

16. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the Si comprises about 0.62 wt.%, the Mg comprises 0.60 wt.%, and the Mn comprises about 0.15 wt.%.

17. The heat treated and slow quenched aluminum alloy sheet of claim 16 wherein the aluminum alloy comprises about 0.20 wt.% Fe.

18. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has a critical fracture strain of at least 15.

19. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has a critical fracture strain of at least 18.

20. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has a yield strength of at least 220 MPa.

21. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has a yield strength of at least 230 MPa.

22. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has a yield strength of at least 240 MPa.

23. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has a critical fracture strain of at least 15, and a yield strength of at least 220 MPa.

24. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has a critical fracture strain of at least 15, and a yield strength of at least 230 MPa.

25. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has a critical fracture strain of at least 15, and a yield strength of at least 240 MPa.

26. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has a critical fracture strain of at least 18, and a yield strength of at least 220 MPa.

27. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has a critical fracture strain of at least 18, and a yield strength of at least 230 MPa.

28. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has a critical fracture strain of at least 18, and a yield strength of at least 240 MPa.

29. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has a thickness of from about 0.7 to about 3.5 mm.

30. The heat treated and slow quenched aluminum alloy sheet of claim 29 wherein the sheet comprises an auto body sheet.

31. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has been slow quenched at a rate of less than 200°F/second.

32. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has been slow quenched at a rate of from about 20 to about 100°F/second.

33. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has been slow quenched at a rate of from about 40 to about 70°F/second.

34. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has been slow quenched at a rate of about 150°F/second.

35. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has been air quenched.

36. The heat treated and slow quenched aluminum alloy sheet of claim 1 wherein the sheet has further been coil cooled.

37. The heat treated and slow quenched aluminum alloy sheet of claim 36 wherein the sheet has been coil cooled at a cooling rate of from about 0.1 to about 5°F/hour.

38. The heat treated and slow quenched aluminum alloy sheet of claim 36 wherein the sheet has been coil cooled from an initial coiling temperature of from about 130 to about 190°F.

39. A method of treating an aluminum alloy sheet, the method comprising:

providing a heat treated aluminum alloy sheet comprising Si, Mg, Mn, and the balance aluminum and incidental impurities; and
slow quenching the heat treated aluminum sheet.

40. The method of claim 39 wherein the sheet is slow quenched at a rate of less than 200°F/second.

41. The method of claim 39 wherein the sheet is slow quenched at a rate of from about 20 to about 100°F/second.

42. The method of claim 39 wherein the sheet is slow quenched at a rate of from about 40 to about 70°F/second.

43. The method of claim 39 wherein the sheet is air quenched.

44. The method of claim 39 wherein the sheet is coil cooled.

45. The method of claim 44 wherein the sheet is coil cooled at a cooling rate of from about 0.1 to about 5°F/hour.

46. The method of claim 44 wherein the sheet is coil cooled from an initial coiling temperature of from about 130 to about 190°F.

47. The method of claim 39 wherein the aluminum alloy comprises from about 0.5 to about 0.7 wt.% Si, from about 0.5 to about 0.7 wt.% Mg, from about 0.1 to about 0.3 wt.% Mn, and the balance Al and incidental impurities.

48. The method of claim 47 wherein the Si comprises from about 0.58 to about 0.68 wt.%, the Mg comprises from about 0.56 to about 0.66 wt.%, and the Mn comprises from about 0.12 to about 0.18 wt.%.

49. The method of claim 48 wherein the aluminum alloy comprises from about 0.15 to about 0.30 wt.% Fe, and a maximum of 0.10 wt.% Cu.

50. The method of claim 47 wherein the Si comprises from about 0.60 to about 0.66 wt.%, the Mg comprises from about 0.58 to about 0.64 wt.%, and the Mn comprises from about 0.12 to about 0.18 wt.%.

51. The method of claim 50 wherein the aluminum alloy comprises from about 0.15 to about 0.25 wt.% Fe, and a maximum of 0.10 wt.% Cu.

52. The method of claim 47 wherein the Si comprises about 0.62 wt.%, the Mg comprises 0.60 wt.%, and the Mn comprises about 0.15 wt.%.

53. The method of claim 39 wherein the sheet has a critical fracture strain of at least 15, and a yield strength of at least 220 MPa.

54. The method of claim 39 wherein the sheet has a critical fracture strain of at least 15, and a yield strength of at least 230 MPa.

55. The method of claim 39 wherein the sheet has a critical fracture strain of at least 15, and a yield strength of at least 240 MPa.

56. The method of claim 39 wherein the sheet has a critical fracture strain of at least 18, and a yield strength of at least 220 MPa.

57. The method of claim 39 wherein the sheet has a critical fracture strain of at least 18, and a yield strength of at least 230 MPa.

58. The method of claim 39 wherein the sheet has a critical fracture strain of at least 18, and a yield strength of at least 240 MPa.

59. The method of claim 39 wherein the sheet has a thickness of from about 0.7 to about 3.5 mm.

60. The method of claim 59 wherein the sheet comprises an auto body sheet.